



A Strategic Approach To Managing Michigan's Roads and Bridges



MAY 2003

TABLE OF CONTENTS

PREFACE	3
Chapter 1 ... INTRODUCTION	4
Basic Principles of Asset Management	4
Act 51 Transportation Funding Committee	5
"Pilot Project"	6
Act 499 of the Public Acts of 2002	7
Chapter 2 ... COUNCIL ACTIVITIES	11
Roles and Responsibilities	11
Public Information Program	13
Training and Data Collection	14
Multi-Year Program	14
Chapter 3 ... FEDERAL-AID ELIGIBLE SYSTEM IN MICHIGAN	16
National Functional Classification	16
Overview of Miles and Distribution	17
Condition of the Federal-Aid Eligible System	19
Investments in the System	23
APPENDIX: COUNCIL MEMBERS	

PREFACE

ANNUAL REPORT OF THE TRANSPORTATION ASSET MANAGEMENT COUNCIL

"The department and each local road agency shall keep accurate and uniform records on all road and bridge work performed and funds expended for the purposes of this section, according to the procedures developed by the council. Each local road agency and the department shall annually report to the council the mileage and condition of the road and bridge system under their jurisdiction and the receipts and disbursements of road and street funds in the manner prescribed by the council, which shall be consistent with any current accounting procedures. An annual report shall be prepared by the staff assigned to the council regarding the results of activities conducted during the preceding year and the expenditure of funds related to the processes and activities identified by the council. The report shall also include an overview of the activities identified for the succeeding year. The council shall submit this report to the state transportation commission, the legislature, and the transportation committees of the house and senate by May 2 of each year."

Section (9) of Act 499 of the Public Acts of 2002

The Transportation Asset Management Council was appointed by the State Transportation Commission on September 26, 2002. They held their first meeting on October 8, 2002. In order to collect condition data on the entire 39,060 miles of federal-aid eligible roads, as required in Act 499, collection must begin in August. Consequently, it was not possible to organize the data collection process. Therefore, the data in this report is based on a "pilot project," jointly conducted by the County Road Association of Michigan and the Michigan Department of Transportation. The data in this report provides an example of the information that will be reported on the entire federal-aid system each year beginning with the May 2004 report.

It is the intent of the Council to analyze and report on the investments made to this system and the resulting condition to the Legislature and State Transportation Commission. In this way, you will be kept up-to-date on the overall condition of our roads and bridges; how we as road agencies are spending the public dollars you have entrusted to us; and the system needs for maintaining and preserving our roads and bridges.

This report was approved by the Council on April 2, 2003.

CHAPTER 1: INTRODUCTION

A. BASIC PRINCIPLES OF ASSET MANAGEMENT

Asset management is an emerging concept in the transportation industry. This process is predicated on the principles of stewardship of public resources, accountability to users of the system, and continuous improvement. As stewards of the public's highways and bridges we can no longer be content to simply account for assets. Instead, we must aggressively ensure the proper use and performance of those assets.

Asset management provides a solid foundation which allows transportation professionals to monitor the transportation system. Further, it helps them plan how to optimize the preservation, improvement and timely replacement of assets through cost-effective management, programming and resource allocation decisions.¹

Asset management involves collecting physical inventory and managing current conditions based on strategic goals and sound investments. It is a continuous, iterative process enabling managers to evaluate various scenarios, determine trade-offs between different actions, and select the best method for achieving specified goals. The major elements of any asset management process are:

- Establishing goals and objectives through development of a strategic plan,
- Collecting data to determine current pavement and bridge condition,
- Using management systems to control the various processes,
- Identifying standards and benchmarks,
- Developing appropriate performance measures,
- Making decisions based on these results and developing an appropriate program,
- Implementing the program, and
- Monitoring and reporting results of actions taken.

While asset management utilizes the outputs of pavement and bridge management systems it is much more than just another management system with a fancy name. The significant difference is that, in many respects, pavement and bridge management systems are used in a "tactical" manner, to identify specific projects. Asset management is a "strategic" approach that looks at the network as a whole rather than individual projects.

While individual road agencies will continue to use their existing systems for tactical, project-level decisions, the Transportation Asset Management Council

¹ Asset Management Primer, USDOT/FHWA, Office of Asset Management, December 1999.

(TAMC) will develop broad, network-level goals and objectives for the federal-aid eligible roads and bridges. The TAMC's process will **not** identify **what** projects need to be undertaken. Rather, it will identify areas of road and bridge deficiencies. It is then up to the individual road agencies to develop the appropriate projects to meet those deficiencies.

The TAMC's process is intended initially to develop a strategy for maintaining, preserving, and improving Michigan's federal-aid eligible roads and bridges. Once this process has been fully established for the federal-aid eligible roads and bridges, it is to be extended to all public roads.²

The strategy will focus on statewide targets for system condition. Further, the Council will provide a baseline methodology for an asset management process. It also will indicate to legislative decision-makers what it will cost to achieve the strategy. While this process is not intended to identify projects it is anticipated that, once the strategy has been developed and subsequently approved by the State Transportation Commission, the projects being scheduled for construction by individual road agencies should address the identified deficiencies.

The benefits of such an approach include:

- Taking a systematic approach to the entire road network,
- Managing rates of deterioration proactively,
- Committing to do the right fix at the right time, and
- Meeting established network goals.

B. ACT 51 FUNDING STUDY COMMITTEE

So how did we get to this point? Act 308 of the Public Acts of 1998 created the Act 51 Transportation Funding Study Committee. This committee was called upon to study transportation funding issues, to weigh information from affected agencies and interest groups, and to make recommendations for the future. After meeting for about 14 months, the committee issued its final report, ***Transportation Funding for the 21st Century***.

The major recommendation coming from the committee was that a long-range asset management process be established to manage Michigan's transportation infrastructure. The committee went on to state:

"In recommending the asset management approach, we are confident that it will take into account the importance of all roads and that they will be represented in equal respect regardless of ownership, according to their relative significance in the overall

² Act 499 of the Public Acts of 2002, Section 2.

transportation system.”³

Other key recommendations from the report were:

- Establish a “Technical Advisory Panel,” made up of key transportation interests, to oversee the asset management process,
- Establish a system of performance measures, along with standards, for all elements of the roadway infrastructure, and
- Collect and maintain road and bridge data for all jurisdictions in a statewide GIS and through the coordination of existing resources.⁴

The committee’s report was fundamental in the drafting of the legislation that resulted in the enactment of Act 499 of the Public Acts of 2002.

C. “PILOT PROJECT”

Legislation was introduced in 2000 to implement many of the recommendations put forth by the committee, however, the Legislature took no action on the bills. Subsequently, individuals from the Michigan Department of Transportation (MDOT) and several county road commissions realized there was an opportunity to test the concepts proposed by the committee.

Officials from the Genesee County Road Commission, MDOT, and the Genesee/Lapeer/Shiawassee Planning and Development Commission met in Flint to discuss the idea of a joint project in Genesee County. A Letter of Agreement was signed in April of 2001.

The idea was to develop and test working guidelines for collecting, storing, reviewing, and analyzing roadway data for the federal-aid eligible system. Condition data would be collected using the Pavement Surface Evaluation and Rating System (PASER). The data collected was to be compatible with the RoadSoft pavement management software and the Michigan Information Center’s Framework GIS transportation base map.⁵

The initial project proved to be valuable to both parties and the Letter of Agreement was expanded to include other counties. This document was signed by the directors of the County Road Association of Michigan and MDOT.

³ *Transportation Funding for the 21st Century*, June 1, 2000, p. 7.

⁴ *Ibid.*

⁵ “Letter of Agreement For Implementing Various Asset Management Concepts,” April 20, 2001.



The project included the following objectives:

- Evaluate the feasibility of using the PASER system for rating Michigan's road system,
- Determine the time and resources necessary to conduct road condition surveys,
- Evaluate procedures for mobile collection of road condition data using Geographic Information Systems (GIS) and Global Positioning Satellite systems (GPS),
- Appraise usage of the Framework files as a foundation for the GIS road map and database; and
- Promote working relationships between government agencies involved in transportation asset management activities.⁶

Initially, 6 counties were rated during 2001. Seven additional counties were rated under the auspices of the "pilot project" in 2002. In November of 2002, the TAMC assumed official oversight of the "pilot project" process.

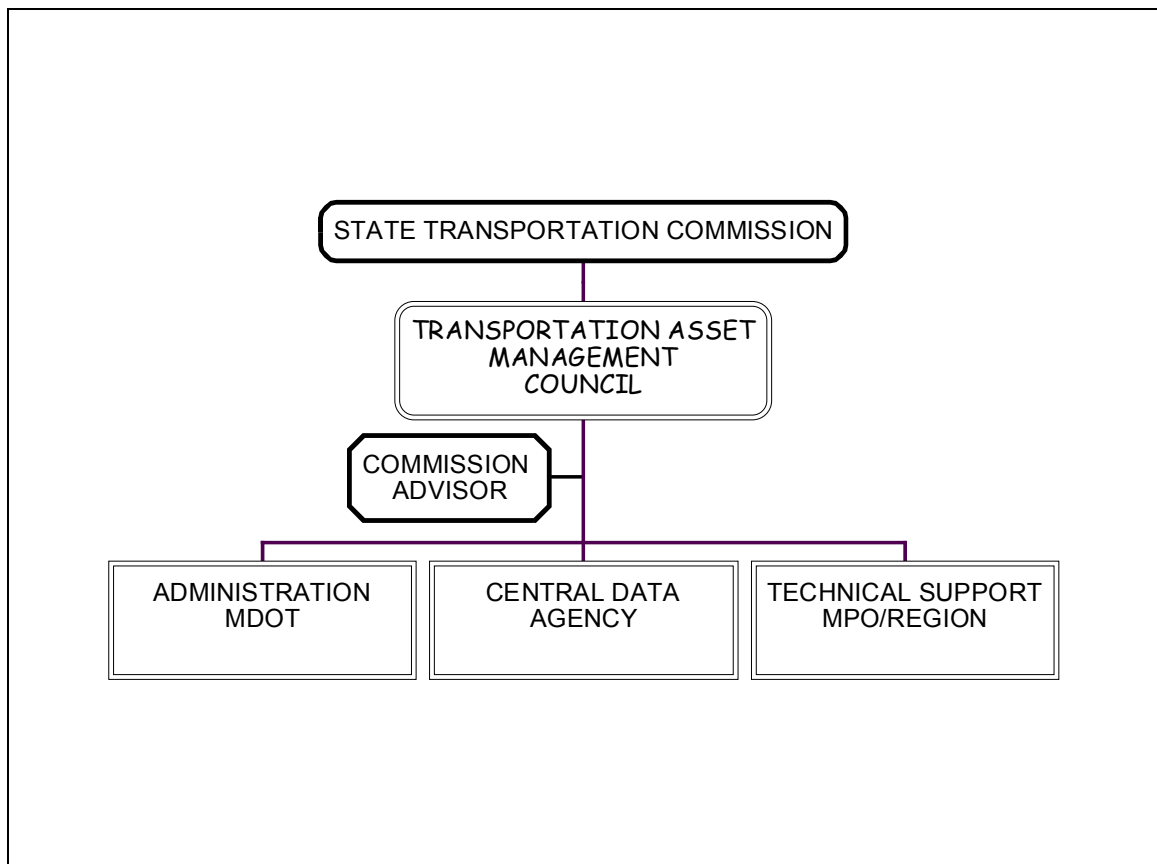
D. ACT 499 OF THE PUBLIC ACTS OF 2002

Building on the recommendations of the Act 51 Transportation Funding Study Committee and the "pilot project," CRAM and MDOT jointly developed a bill

⁶ "PASER Cooperative Road Condition Survey Demonstration Project," CRAM/MDOT, January 2002, p. 1.

for consideration by the Legislature. Rep. Larry Julian introduced HB 5396 in the fall of 2001. The bill, after a few minor amendments, passed the Michigan House of Representatives in December of 2001. The Senate added a couple of amendments and passed a substitute version in June of 2002. Governor John Engler signed the bill in July creating Act 499 of the Public Acts of 2002.

The law establishes the Transportation Asset Management Council (TAMC). The Council is comprised of professionals from county road commissions, cities, a county commissioner, a township official, regional and metropolitan planning organizations, and state transportation department personnel. The Council reports directly to the State Transportation Commission. The Commission's Advisor serves as the liaison to the Council.



The law amended Section 9(a) of Act 51 of the Public Acts of 1951. It replaced the Act 51 Transportation Funding Study Committee with the newly created Council. It also replaced the traditional needs study process with a strategic asset management process. The law identified this process as an "on-going process of maintaining, upgrading, and operating physical assets

cost-effectively, based on a continuous physical inventory and condition assessment.”⁷

Recognizing the significance of the legislation, Rep. Rick Johnson, Speaker, of the Michigan House of Representatives stated: “The state Legislature set up a table where all of the agencies responsible for roads and bridges can have a seat. The level of cooperation between agencies that could come from this is unprecedented. We all stand to benefit from this.”

1. Mission Statement

The Council’s mission is taken directly from Act 499 and states:

“In order to provide a coordinated, unified effort by the various roadway agencies within the state, the transportation asset management council is hereby created within the state transportation commission and is charged with advising the commission on a statewide asset management strategy and the processes and necessary tools needed to implement such a strategy beginning with the federal-aid eligible highway system, and once completed, continuing on with the county road and municipal systems, in a cost-effective and efficient manner.”⁸

2. Products and Reports

The law requires the TAMC to produce five different products and reports. They are:

- A work program within 90 days of its first meeting – Section (5),
- An asset management strategy, including the tools and procedures necessary to produce this strategy – Section (2),
- An annual report to be submitted to the State Transportation Commission and the Legislature by May 2nd of each year – Section (9),
- A multi-year program of projects expected to be built over the next three years. This program is to be published by October 1st of each year – Sections (7) and (1)(i), and
- An annual budget – implied by Section (8).

⁷ Act 499 of the Public Acts of 2002, Section 9(a)(1)(a).

⁸ *Ibid*, Section (2).

3. Roles and Responsibilities

Act 499 requires the Michigan Department of Transportation (MDOT), the regional planning agencies, and metropolitan planning organizations to carry out specific responsibilities.

Section (4) requires MDOT to provide qualified administrative staff to the Council. Personnel from the Bureau of Transportation Planning will primarily carry out this requirement. Section (9) requires that this staff prepare the Council's **ANNUAL REPORT**.

Section (4) also requires the state planning regions and metropolitan planning organizations to provide qualified "technical" assistance to the Council, although the law does not define what constitutes technical assistance. The Council is currently in the process of identifying specific activities that will be conducted by these agencies.

4. Critical Principles

There are several critical principles within the law and from the Act 51 Transportation Funding Study Committee final report that will assist the way the Council approaches its responsibilities.

- The methods employed are to be done in a cost-effective and efficient manner.
- Activities are to be consistent with existing federal regulations and current accounting practices, i.e., GASB 34.
- This is to be a coordinated, unified effort.
- Wherever possible use existing resources.

CHAPTER 2: COUNCIL ACTIVITIES

A. ROLES AND RESPONSIBILITIES

The Council has several specific responsibilities that are enumerated in Act 499. These include:

- Recommending an asset management strategy to the State Transportation Commission,
- Choosing the tools and procedures necessary for developing this strategy,
- Selecting a data agency, and
- Establishing procedures for collecting data and filing reports.

1. Recommend Asset Management Strategy

According to Act 499, asset management is a strategic process, which views the highway system in a coordinated, unified manner. A strategic asset management process:

- Sets goals and objectives for the system,
- Undertakes life-cycle cost analyses, and
- Recommends investment strategies that will prolong the system's useful service life.

The Council is charged with determining how to do this and proposing a strategy to the State Transportation Commission for formal adoption. **It is anticipated that it will take a minimum of three years before such a strategy can be recommended.** The reason for this is that the models used for developing such strategies generally need at least three years worth of data to develop the curves necessary to produce the trend lines. During 2003, the Council will begin testing various models to determine their effectiveness for use in Michigan.

2. Choose Tools and Procedures

The Council must also decide, during the coming year, which tools and procedures will be employed in the development of this strategy. This will require:

- Selecting a condition assessment method,
- Determining the level and type of data that needs to be collected,
- Selecting a "predictability" model for assessing various strategies and revenue scenarios, and
- Developing a method to monitor progress from one year to the next.

3. Select a Data Agency

Section (1)(c) of Act 499 stipulates that a “central data storage agency” will be chosen by the Council for storing and maintaining data that is collected for the Council’s asset management process. The law also provides that the agency chosen will have a non-voting seat on the Council.⁹ This will be a critical activity during 2003.

4. Establish Data Collection and Reporting Procedures

Section (5) of Act 499 requires the Council to establish “procedures and requirements as are necessary for the administration of the asset management process.”¹⁰ This is to include procedures for the collection and storage of the data and any reporting requirements established in the law. These procedures and requirements must be consistent with “any existing federal requirements and regulations and existing government accounting standards.”¹¹

In any asset management process, it is absolutely essential that clear procedures be developed and followed. The Federal Highway Administration provides guidelines on the type of information that should be documented. “The analysis involves gathering all relevant information pertaining to the data:

- Where the data come from and who collects the data
- Method and frequency of collection
- Reference system or system used
- Structure, format, and size of the data
- How the data are transmitted, processed, and stored
- General quality of the data in terms of accuracy, completeness, recency, and redundancy
- How the data are used...
- Applications that draw data from the data bases...
- Types of reports produced.”¹²

It is, also a critical step in any asset management process to solicit stakeholder input, and numerous federal regulations require input from the public.

“The early involvement of key stakeholders in the process will enhance the successful implementation of AM [asset management] planning...One approach to external consultation is to prepare a focused public discussion document summarizing the key points of basic initial AM plans....”¹³

⁹ Act 499 of the Public Acts of 2002, Sections (2) and (3)

¹⁰ Act 499 of the Public Acts of 2002, Section (5)

¹¹ *Ibid.*

¹² Data Information Primer, USDOT/FHWA, p. 14.

¹³ International Infrastructure Management Manual *op.cit.*, pp. 2.31-2.32.

During 2003, the Council will develop a procedures manual to cover the areas of data collection, data accuracy, data storage, data reporting and analysis. The Council will, with the cooperation and coordination from the regional planning agencies and MPOs, hold a series of meetings with local road agencies and MDOT staff to solicit their input. A final document will then be prepared, and upon approval, this document will be distributed to all road agencies, regional planning agencies and MPOs.

B. PUBLIC INFORMATION PROGRAM

The Council is cognizant of the fact that Act 499 substantially changes the way we approach maintaining our highway and bridge system. One of the key objectives of this effort is for all road agencies to approach their respective responsibilities in a spirit of cooperation. Without a regular, consistent public information program misinformation and misinterpretation can occur regarding what is trying to be accomplished by this effort.

It is the intent of the Council to make every effort to keep state and local road agencies, key stakeholders, and the general public informed of the activities being conducted and the results of those activities. In order to achieve this, the Council will, during 2003:

- Work through the regional planning agencies/MPOs, to hold a series of meetings around the state to explain the requirements of Act 499 and the activities being developed by the Council.
- Provide monthly reports to the State Transportation Commission, the County Road Association of Michigan, the Michigan Municipal League, the Michigan Department of Transportation, the Michigan Association of Regions, the 3C Board of Directors, the Michigan Association of Counties and the Michigan Townships Association.
- Provide quarterly reports to key stakeholders such as the leadership of the House and Senate and their respective Transportation Committees, the Michigan Chamber of Commerce, Michigan Road Builders Association, Michigan Manufacturer's Association, Michigan Farm Bureau, Michigan Trucking Association and others.

The Council has established a webpage where interested parties can receive up-to-date information on the meetings and activities of the Council. The webpage address is:

www.michigan.gov/mdot/0,1607,7-151-9623_10697_22810---,00.html

C. TRAINING AND DATA COLLECTION

One of the most critical issues identified by the Act 51 Transportation Funding Study Committee was the fact that there was no uniform method for assessing the condition of Michigan's roads. There are plenty of methods being used from PASER to Micro-paver, to distress index, to international roughness index. While all of these methods are valuable they don't necessarily translate into a uniform rating system so that decision-makers can compare one road to the next. Act 499 solves this problem. The TAMC was specifically created to "provide a **coordinated, unified effort** by the various roadway agencies within the state".¹⁴ (Emphasis added.)

"The key to successful asset management is the collection of reliable and sufficient data about the asset, collating this data into information, and interpreting this information to obtain intelligence about the asset. To be valid and appropriate the data must be:

- Relevant to the...decisions to be made.
- Affordable and cost-effective so that regular collection and updating can be sustained.
- Reliable and adequately accurate for the intended purposes.
- Readily accessible and in a format suitable for those who need to manage and evaluate maintenance practices."¹⁵

Throughout the asset management process it is important to have trained individuals conducting the data collection, analyzing the data, running the strategic analysis, etc. The Council will need to determine and establish training procedures and to conduct the training sessions. Training for data collection should take place during the months of June and July. Data collection will begin in August and continue through the end of November.

D. MULTI-YEAR PROGRAM

Another major report required by Act 499 is the development of a "multi-year" program that must be published each year by October 1. This document is to contain a list of projects that are being funded with state or federal funds for the next three years. It is the intent of the Council to work through the regional planning agencies and metropolitan planning organizations to accomplish this requirement.

¹⁴ Act 499 of the Public Acts of 2002, Section (2).

¹⁵ State Highway Asset Management Manual, TRANSIT New Zealand, August 23, 2000, p. 45.

KEY COUNCIL ACTIVITIES FOR 2003

Submit Work Program to State Transportation Commission for Approval

Develop Public Information Program

Survey Road Agencies Regarding Condition Assessment Methods

Initiate Training Program for Data Collection Process

Collect Pavement Condition Information

Develop and Publish Multi-Year Program

Test and Analyze Various Models

Develop Performance Measures

Select Data Agency

Develop Procedures Manual

CHAPTER 3: FEDERAL-AID ELIGIBLE SYSTEM IN MICHIGAN

A. NATIONAL FUNCTIONAL CLASSIFICATION

National Functional Classification (NFC) is a planning tool used by federal, state, and local transportation agencies since the late 1960's. The Federal Highway Administration (FHWA) developed this method of classifying all roads according to their function. The NFC designation of a given road determines whether it is a federal-aid road and eligible for federal funds. The method establishes a hierarchical system consisting of arterials, collectors, and local roads.

1. Arterials: Arterials are divided into subcategories of *principal* and *minor*. Principal arterials are at the top of the hierarchy. Principal arterials generally carry long distance, through-travel movements. They also provide access to important traffic generators such as major airports or regional shopping centers. Examples of principal arterials include freeways, major U. S. routes, state trunk lines between large cities, and important streets in large cities. Minor arterials are similar in function to principal arterials, except they carry trips of a shorter distance and to lesser traffic generators. Examples include state routes between smaller cities, surface streets of medium importance in large cities, and important surface streets in smaller cities.

2. Collectors: Collectors tend to provide more access to property than do arterials. Collectors also funnel traffic from residential or rural areas to arterials. Examples of collector roads include county, farm-to-market roads, and various connecting streets in large and small cities.

3. Local: Local roads primarily provide access to property such as residential streets and lightly traveled rural roads.

The following chart shows the distribution of NFC roads by state, city, and county for the 2001 certified miles.

	STATE	CITY	COUNTY	TOTAL
ARTERIALS	9,110.67	1,644.57	2,935.91	13,691.15
Percent	66.5%	12.0%	21.4%	34.8%
COLLECTORS	591.22	1,829.55	23,248.49	25,669.26
Percent	2.3%	7.1%	90.6%	65.2%
TOTAL	9,701.89	3,474.12	26,184.40	39,360.41
Percent	24.7%	8.8%	66.5%	100%

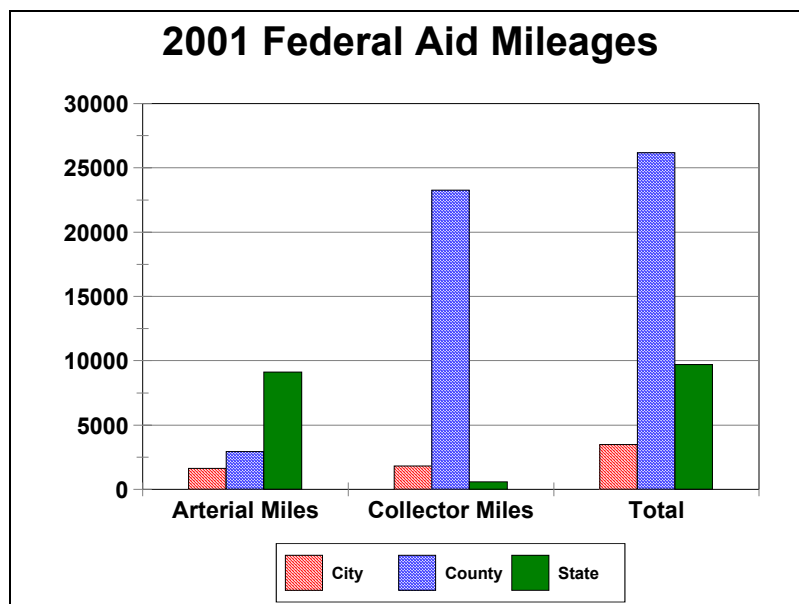
B. OVERVIEW OF MILES AND DISTRIBUTION

There are 617 city, county, and state agencies that own road and bridge assets in Michigan that are funded through Act 51. The total certified public miles, as of July 1, 2002, were 120,060. This total has grown by slightly more than 420 miles since 1998. The majority of this increase, nearly 415 miles, was on local roads that are not eligible for federal aid.

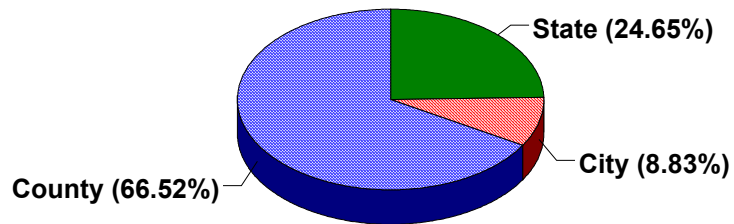
Of the 617 entities, 533 or 86% are cities and villages. While the cities and villages comprise the largest group of owners, they manage the fewest number of miles -- with 378 of them owning 25 miles or less. Only 39 cities own more than 100 miles of roads while all 83 counties own 175 miles or more, respectively. Keweenaw County Road Commission is the smallest county-owned system with 175 miles. Even so, it is larger than 89% of the city-owned systems. MDOT has the largest system with 9,717 route miles (or 12,033 pavement miles). Oakland County has the second largest system with 2,649 miles, followed by Detroit with 2,572 miles, and Kent County with 1,959 miles.

The distribution of mileage among the 617 entities is not balanced or uniform. Sixty-five of the owners (MDOT, Detroit and 63 counties), or just over 10%, own 75% of the assets; and 20%, or 123 entities, own 92% of the assets.

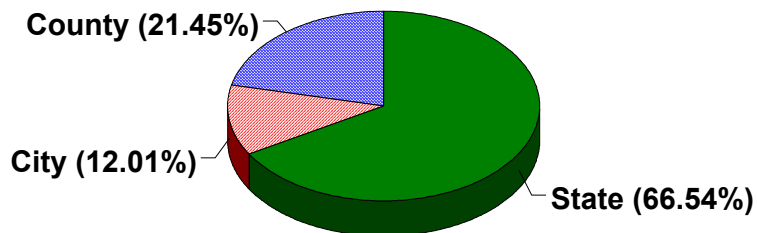
The following graphs show the distribution of miles by arterials and collectors.



Federal-Aid Mileages Percentage Distribution

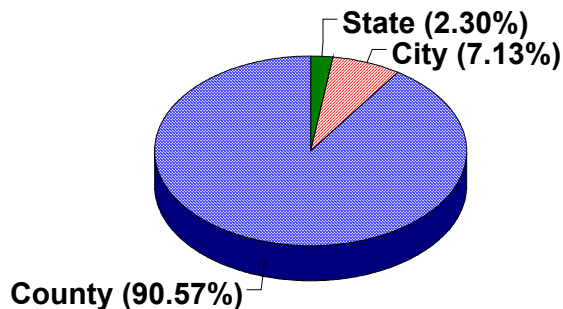


Arterial Distribution 2001 Certified Miles



Collector Distribution

2001 Certified Miles



C. CONDITION OF THE FEDERAL-AID ELIGIBLE SYSTEM

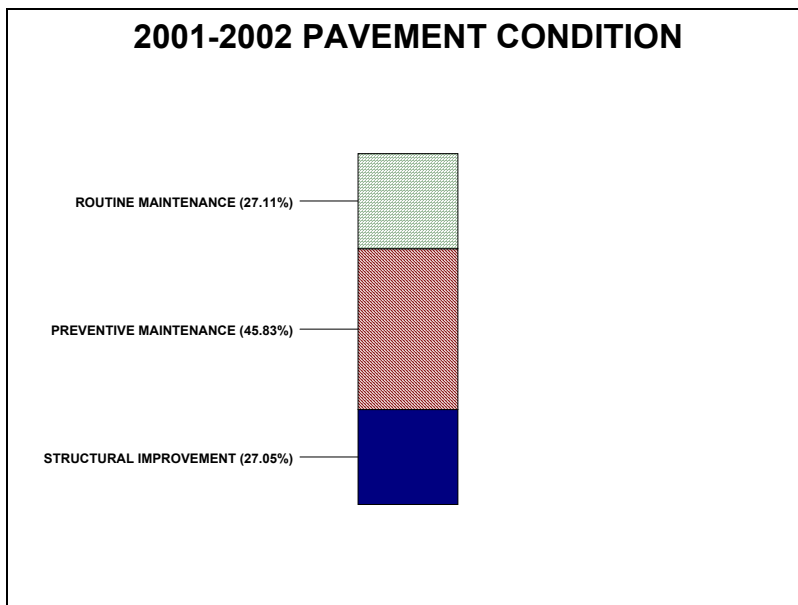
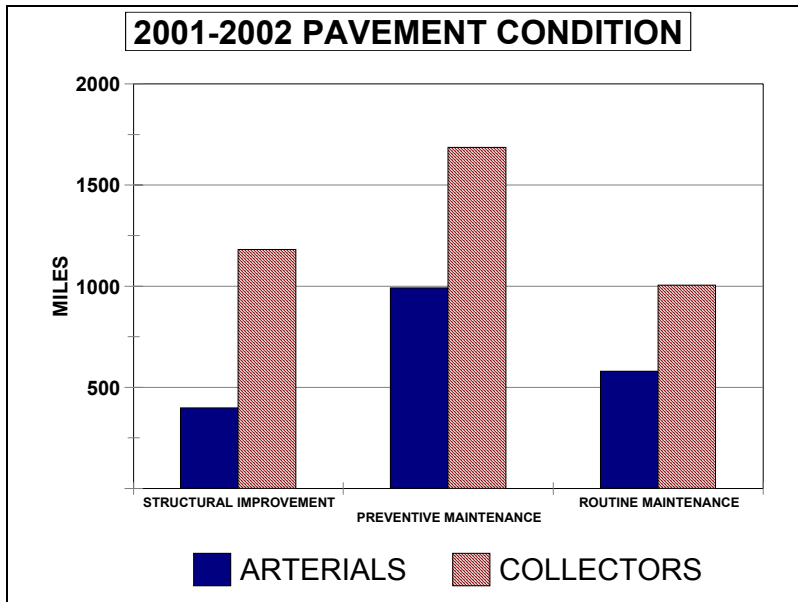
1. Highways, Roads, and Streets

As noted in the PREFACE, it was not possible for the Council to survey the entire 39,060 miles of federal-aid eligible roads last fall. Therefore, the data in this section is that obtained through the Pilot Project discussed in Chapter 1. During that project 5,843 miles or 15%, of the federal-aid eligible system were surveyed between April 2001 and October 2002. The system was surveyed using the Pavement Surface Evaluation and Rating (PASER) system. PASER is a visual survey which rates the condition of various types of pavement on a scale of 1-10

The ratings were then assembled into three categories of "ROUTINE MAINTENANCE" (ratings 8, 9, 10), CAPITAL PREVENTIVE MAINTENANCE (ratings 5, 6, 7) and STRUCTURAL IMPROVEMENTS (ratings 1, 2, 3, and 4) which represent broad areas of work that might be undertaken to maintain, preserve, and improve network condition. The following table and graphs show the distribution of miles by these different types of work.

	STRUCTURAL IMPROVEMENT	PREVENTIVE MAINTENANCE	ROUTINE MAINTENANCE	TOTALS
RATING	1, 2, 3, 4	5, 6, 7	8, 9, 10	
ARTERIALS	398.5	992.3	579	1969.8
Percent	6.8%	17.0%	9.9%	33.7%
COLLECTORS	1,182.3	1,685.6	1,005.3	3,873.2
Percent	20.2%	28.9%	17.2%	66.3%
TOTALS	1,580.8	2,677.9	1,584.3	5,843

This first graph shows the condition sorted by arterial and collector. The second graph shows both classes combined.



Overall, 73% of the sample roads are in good condition and with the proper maintenance should remain so for many years. On the other hand, 27% is in need of some type of structural repair such as major rehabilitation or reconstruction. The bulk of this need is on the collector system. Of the total miles needing structural improvements 75% are on roads designated as collector. Only 20% of the arterial system is in need of structural improvements.

What is of critical importance in an asset management process is for a road agency to not simply concentrate on the roads needing structural improvements. This constitutes what is often referred to as a “worst-first” strategy; that is we fix the worst roads first. But this often results in a position where you are falling behind in your efforts to keep the total system at a reasonable condition.

Asset management says that while it is important to repair those roads that need structural improvement it is equally important to minimize the number of miles falling from the preventive maintenance category into the structural improvement category. It has been demonstrated that if you allow a road to deteriorate to the point that it must be reconstructed it can cost up to 4 times more than if you applied lower cost repairs during the preventive maintenance phase. All of us understand that getting regular tune-ups and oil changes for our vehicles is far cheaper than replacing a blown engine. It is simply the practical application of the old adage: “You can pay me now ... or you can pay me later.”

2. Bridges

Bridges can be classified as “structurally deficient” or “functionally obsolete.” These classifications are determined by the National Bridge Inventory database (NBI). A **structurally deficient** bridge is one in which at least one of the major structural elements (deck, superstructure, or substructure) has a condition rating of poor or worse. A **functionally obsolete** bridge is one that is not structurally deficient, but has deficient roadway width, vertical clearance, waterway, road alignment or load capacity.

Federal law requires that bridges be inspected at least once every two years. There are 9 different categories which determine whether a bridge is classified as “deficient.” Condition ratings are based on a 0-9 scale and assigned for the superstructure, the substructure, and the deck of each bridge. A condition of 4 or less classifies the bridge as being “deficient.”

<u>CATEGORIES</u>	<u>NBI CONDITION RATINGS</u>
Culvert Condition	9=Excellent
Approach Alignment	8=Very Good
Underclearance	7=Good
Deck Geometry	6=Satisfactory
Waterway Adequacy	5=Fair
Structural Evaluation	4=Poor
Substructure Condition	3=Serious
Superstructure Condition	2=Critical
Deck Condition	1=“Imminent” Failure
	0=Failure

Structurally Deficient: Generally, a bridge is structurally deficient if any major component is in “poor” condition. If any one or more of the following are true, then the bridge is structurally deficient.

- Deck Rating is less than 5
- Superstructure Rating is less than 5
- Substructure Rating is less than 5
- Culvert Rating is less than 5
- Structural Evaluation is less than 3
- Waterway Adequacy is less than 3

Functionally Obsolete: Generally, a bridge is functionally obsolete if it is NOT structurally deficient AND its clearances are significantly below current design standards for the ADT being carried on or under. More specifically, if the bridge is NOT structurally deficient AND any one or more of the following are true, then the bridge is functionally obsolete.

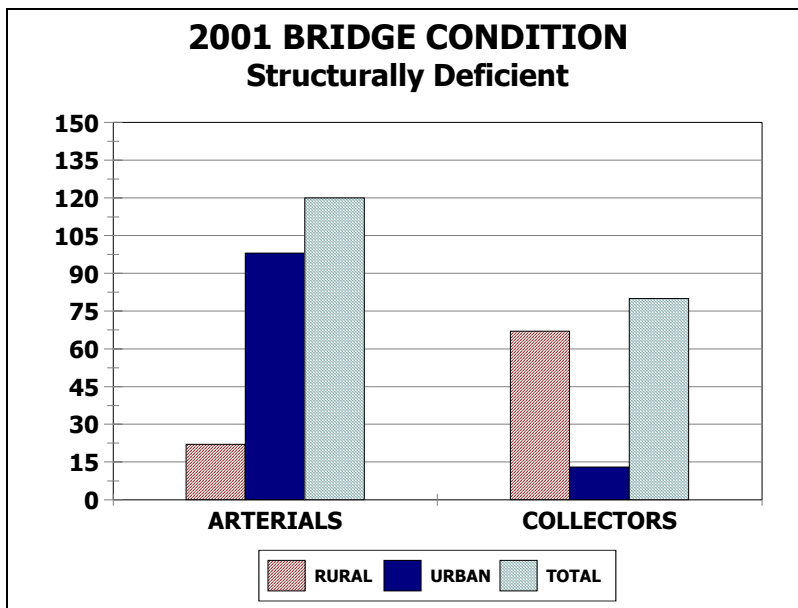
- Structural Evaluation = 3
- Deck Geometry is less than 4
- Underclearance is less than 4 and there is another highway under the bridge
- Waterway Adequacy = 3
- Approach Roadway Alignment is less than 4

A bridge cannot be both structurally deficient and functionally obsolete. If a bridge qualifies for both, then it is structurally deficient. While functionally obsolete bridges represent needed improvements if the overall system is to achieve maximum operating efficiency, the bridges rated as structurally deficient require more immediate attentions.

The following table and accompanying graph show the condition of the bridges in the 13 counties involved in the Pilot Project.

	ARTERIALS	COLLECTORS	TOTALS
STRUCTURALLY DEFICIENT	120	80	200
Percent	9.0%	6.0%	15.0%
FUNCTIONALLY OBSOLETE	114	59	172
Percent	8.6%	4.4%	12.9%
GOOD CONDITION	551	407	958
Percent	41.4%	30.6%	72.0%

Source: National Bridge Inventory



There were a total of 1,330 bridges rated, of which, 72% are in good condition and 15% are considered structurally deficient. In general, the bridges requiring the greatest attention in urban areas are on the arterial system while in rural areas they are on the collector system.

D. INVESTMENTS ON THE SYSTEM

In future reports, the Council will include the amount of money expended on the system during the previous calendar year. Again, due to the small amount of time that the Council has been in existence, it was not possible to collect and analyze expenditures from 617 entities in time for this report. The 2004 Annual Report will contain this information.

APPENDIX

Steven Warren

Deputy Director/Director of Planning
Kent County Road Commission
1500 Scribner Avenue NW
Grand Rapids, Michigan 49504
Telephone: 616-242-6949
Email: swarren@kentcountyroads.net
Fax: 616-242-6980

Thomas Wieczorek, City Manager

City of Ionia
P.O. Box 496
Ionia, Michigan 48846-0496
Telephone: 616-527-4170 - Ext. 223
Email: tom@city.ionia.mi.us
Fax: 616-527-0810

Carmine Palombo, Director

Transportation Programs
Southeast MI Council of Governments
535 Griswold, Suite 300
Detroit, Michigan 48226
Telephone: 313-961-4266
Email: palombo@semcog.org
Fax: 313-961-4869

Susan Mortel, Director

Bureau of Transportation Planning
Michigan Department of Transportation
P.O. Box 30050
Lansing, Michigan 48909
Telephone: 517-373-0343
Email: mortels@michigan.gov
Fax: 517-241-3862

John Elsinga, Township Supervisor

Delhi Charter Township
2074 Aurelius Road
Holt, Michigan 48842
Telephone: 517-694-2137
Email: john.elsinga@delhitownship.com
Fax: 517-699-3847

William McEntee

Director of Permits & Environment
Road Commission for Oakland County
2420 Pontiac Lake Road
Waterford, Michigan 48328
Telephone: 248-858-4891
Email: bmcentee@rcoc.org
Fax: 248-858-4773

John Kolessar, City Engineer

City of Bay City
301 Washington Avenue
Bay City, Michigan 48708-5866
Telephone: 989-894-8181
Email: jkolessar@baycitymi.org
Fax: 989-894-8214

Rick Deuell, Planner

Northeast MI Council of Governments
P.O. Box 457
Gaylord, Michigan 49735
Telephone: 989-732-3551 - Ext. 14
Email: rdeuell@nemcog.org
Fax: 989-732-5578

Kirk Steudle, Chief Deputy Director

Michigan Department of Transportation
P.O. Box 30050
Lansing, Michigan 48909
Telephone: 517-373-2114
Email: steudlek@michigan.gov
Fax: 517-373-6457

Aaron Hopper, Vice Chairman

Chippewa County Board of Commissioners
2934 East 3 Mile Road
Sault Ste. Marie, Michigan 49783
Telephone: 906-635-5432
Email: aahopper@sault.com
Fax: 906-635-5432